showing that voluntary contraction of muscles of the frog induces either no secondary contraction at all, or a single initial or several single contractions.

On irritating the nerve of the primary muscle with an induced current, the interruptions of which are of exactly the frequency necessary to maintain a constant tetanus, the induced tetanus of the secondary muscle will not be perfectly constant. It becomes constant, however, on increasing the number of interruptions. On increasing the number still further, there occurs instead, in the secondary nerve-muscle preparation, a brief initial tetanus, or merely a single initial contraction. The same occurs when the separate contractions of the primary muscle are prolonged by fatigue. In the latter case the electric intensity of the primary muscle is weakened by the fusion of the separate negative variation due to each contraction. Like Friedrich, the authors also found the tetanus of constant currents accompanied by a single initial, rarely terminal induced contraction. (*Centralblatt,* No. 37, 1877.)

THE CEREBRAL CONVOLUTIONS.—Prof. Ad. Pansch mentions in the *Centralblatt,* (No. 36, 1877) the general results of several years researches on the cerebral convolutions.

I. The furrows and convolutions of the cerebrum are the manifestation of folds, the mode of origin of which is but partly known.

II. The arrangement of the folds follows certain laws, and is always the same in the same class of animals. According to the type of the cerebral convolutions, mammals can be divided into smaller and larger groups. Certain variations occur in every type, their number increasing with the complication of the type.

III. The first appearance of furrows on the smooth brain of the fœtus consists usually of short, sharp incisures. Their elongation is either direct or due to the fusing of adjacent furrows. Later furrows also arise as shallow indentations.

IV. Not all furrows originate simultaneously; their development requires periods of different length before and after birth, according to the species.

V. The furrows first in appearance are in any one class, or even in a larger group, almost always the same, and in the same position, (constant primary furrow). This is most strictly the case among the simpler types, less so among the more complicated ones. All furrows arising subsequently are subjected to greater variation in shape and position, the more the later their appearance, and the more complicated the type.

VI. The growth in depth of the furrows in the course of their development is a rather uniform process. The furrows last in appearance remain shallow, the earlier ones are always deep. Thus the history of development of the furrows can be traced in the adult brain by their depth.

VII. The growth of two convolutions separated by a furrow is usually uniform, and thus the walls of the furrow become perpendicular to the surface of the cortex. But irregularities also occur, so that either the furrow remaining perpendicular, one convolution exceeds the other in heighth, and the cortex becomes uneven, or the cortex remaining smooth, the furrow assumes an oblique direction, and one convolution overtops the other, (formation of opercula). The latter process, as well as the union or non-union of separate furrows, give rise to the variations in the species or individuals.

VIII. A subsequent disappearance of existing furrows occurs but rarely, (and never after the fifth month).

On the strength of these theorems, the author insists on the following methods in the study of the brain:

1. The study of the cerebral convolutions must be accompanied by a consideration of their development. Especially is this requisite in the classification of the cortex. Where fœtal brains are not to be had, the study of the depth of the furrows can take their place.
2. The furrows and their depth are the first and most important object of every research and description. The primary and secondary convolutions thus come to be considered naturally as divisions of the cortex, limited and separated by primary, secondary or tertiary furrows. Deceptions due to the external superficial appearance of convolutions should be avoided.
3. Geometrical drawings ought to be made in large numbers. If they include the four sides of the specimen, they are a perfect substitute for the original. Artistic shading is not only superfluous, but even harmful; the depth, however, of the furrows ought to be a part of the drawing.
4. The next problem ought to be extended observations on the position, shape, and depth of the primary furrows. Only when this has been completed can the detailed investigation of the less constant secondary furrows and convolutions be of use. G.

THE MOTOR CENTRES FOR THE MEMBERS.—At the session of the Acad. de Médicine, Paris, Oct. 23 (reported in *Le Progres Médical*). M. Bourdon read a paper entitled, "Clinical Researches on the Motor Centres for the Members." M. Gosselin, in his report on the memoirs of M. M. Lucas. Champonniere, Proust and Terrillon, having raised the question of cerebral localization, M. Bourdon undertook some investigations on the subject, with the idea of testing by clinical observations the results of experiments made upon animals; his study was directed especially to the motor centres for the limbs. Having observed a very clear and precise case of brachial monoplegia, he compared it with all others as apparently conclusive to him, many of the cases never having been published.

He cited first his observation, reported by M. Darrolles, *interne* of the hospitals. An old man, of a very much deteriorated constitution, after a simple attack of vertigo, was suddenly affected with paralysis limited to the muscles of the forearm and hand of the right side, with preservation of the sensibility. Speech was quickly recovered; but the partial paralysis of the superior member persisted until death. At the autopsy,